

What is claimed is:

1 1. A structure for reducing the diffraction effect
2 in periodic electrode arrangements, comprising:

3 a plurality of first electrodes and a plurality of
4 second electrodes, wherein the first electrodes
5 and the second electrodes are periodically
6 disposed and one of the two or both are
7 transparent electrodes;

8 multiple layers of transparent dielectric layers
9 having different diffraction indexes, formed in
10 predetermined thicknesses among the plurality
11 transparent electrodes, wherein the diffraction
12 index and the thickness of the transparent
13 dielectric layers and the transparent
14 electrodes satisfy the following equation:

15

$$0.8 n_{ed} d_{ed} \leq n_1 d_1 + n_2 d_2 + \dots + n_x d_x \leq 1.2 n_{ed} d_{ed}$$

16

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18 wherein n_1 is the diffraction index of the first
19 dielectric layer, n_2 is the diffraction index of
20 the second dielectric layer, n_x is the
21 diffraction index of the x^{th} dielectric layer,
22 n_{ed} is the diffraction index of the transparent
23 electrode, d_1 is the partial or overall
24 thickness of the first dielectric layer, d_2 is
25 the partial or overall thickness of the second
26 dielectric layer, d_x is the partial or overall
27 thickness of the first dielectric layer, and d_{ed}
28 is the thickness of the transparent electrode.

1 2. The structure as claimed in claim 1, wherein
2 the transparent dielectric layer is silicon-rich oxide or
3 nitride formed by chemical vapor deposition.

1 3. The structure as claimed in claim 1, wherein
2 the transparent dielectric layer is titanium dioxide,
3 zinc oxide, Cerium dioxide or zinc sulfide.

1 4. The structure as claimed in claim 1, wherein
2 the transparent dielectric layer is fluorine-containing
3 glass.

1 5. The structure as claimed in claim 1, wherein
2 the transparent electrodes are ITO, IZO, AZO or ZnO.

1 6. The structure as claimed in claim 1, wherein
2 the partial or overall thickness of the dielectric layer
3 is the combined thickness of the dielectric layer and the
4 transparent electrodes.

1 7. A liquid crystal display device, comprising:
2 an active matrix substrate;
3 a second substrate, disposed opposite the active
4 matrix substrate; and
5 liquid crystal, filled in between the two
6 substrates;
7 wherein the active matrix substrate comprises:
8 a pixel comprised of a pixel electrode disposed as a
9 matrix and a common electrode; and
10 an switching element formed on the liquid crystal
11 side of the first substrate, for controlling
12 the operation of the pixel, above which a

13 number of signal lines and scanning lines
14 intersect;

15 wherein one or both of the pixel electrodes and the
16 common electrodes are transparent, and their
17 structure is as claimed in claim 1.

1 8. The device as claimed in claim 7, wherein the
2 active matrix substrate is a thin film transistor matrix
3 substrate.

1 9. The device as claimed in claim 7, wherein the
2 liquid crystal display device is a liquid crystal display
3 device in lateral electric field switching mode
4 comprising periodically-disposed electrodes.

1 10. The device as claimed in claim 7, wherein the
2 liquid crystal display device is a liquid crystal display
3 device in plane switching mode comprising periodically-
4 disposed electrodes.

1 11. The device as claimed in claim 7, wherein the
2 liquid crystal display device is a liquid crystal display
3 device in fringe-field switching mode comprising
4 periodically-disposed electrodes.

1 12. The device as claimed in claim 7, wherein the
2 liquid crystal display device is an LCD projector.

1 13. The device as claimed in claim 7, wherein the
2 liquid crystal display device is a reflective display
3 device.

1 14. The device as claimed in claim 7, wherein the
2 liquid crystal display device is semi-transparent display
3 device.